



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,780	11/18/2002	Yaw-Ming Tsai	TOPP0001USA	2414

27765 7590 09/15/2003

NAIPO (NORTH AMERICA INTERNATIONAL PATENT OFFICE)  
P.O. BOX 506  
MERRIFIELD, VA 22116

EXAMINER

ROCCHEGIANI, RENZO

ART UNIT	PAPER NUMBER
----------	--------------

2825

DATE MAILED: 09/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/065,780

Applicant(s)

TSAI, YAW-MING

Examiner

Renzo N. Rocchegiani

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 13, 14, 17-27, 33 and 36 is/are rejected.
- 7) ☒ Claim(s) 8-12, 15, 16, 28-32, 34 and 35 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 20-21, 23 and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application No. 2001/0041455 A1 (Yun et al.).

Yun et al. disclose a process to manufacture a semiconductor device comprising the steps of forming a photoresist layer ([0027]) over a dielectric layer ([0027]), patterning the photoresist layer to form an opening extending through to the surface of the dielectric layer ([0027]), performing a dry etching process to remove parts of the dielectric layer to form a contact hold extending to the surface of the conductive layer ([0030]) and performing a post treatment process to form a protective layer and stripping the photoresist. ([0030] and [0029]) The process further comprises removing the protective layer after stripping the photoresist. (Fig. 8) A contact plug is formed in the via hole. ([0027])

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2825

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-7, 13-14, 17-19, 22, 24-25, 27, 33 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2001/0041455 A1 (Yun et al.) in view of U.S. Patent No. 5,185,601 (Takeda et al.)

As stated in paragraph 2, all the limitations of the claims have been met except for specifying that the semiconductor device is an LCD comprising a gate, that the plug is a bus data line, that the conductive layer is made of polysilicon or amorphous silicon, the thickness of the protective layer, and that the dielectric layer is etched in a wet etch process.

Yun et al. discloses that the invention may be employed in a number of semiconductor manufacturing including bit lines. ([0031]).

Takeda et al. teaches a process to form an LCD comprising a driving transistor, and a bus line (col. 4, lines 60-63) wherein the conductive material may comprise amorphous silicon or polysilicon (col. 4, lines 50-53), and wherein the device comprises a metal gate structure (col. 4, lines 64-67).

It would have been obvious to one having ordinary skill in the specific art to combine the teachings of Takeda et al. to the invention of Yun et al., since Yun et al. discloses the application of its invention to any semiconductor process and Takeda et al. teaches a well known semiconductor device structure formed using photolithographic process steps wherein metal would be exposed to the photoresist stripping agents.

Art Unit: 2825

Further, it would have been obvious to one having ordinary skill in the art to use a wet etching process to form the contact hole, since the examiner takes official notice that wet etching of dielectric material in via formation is well known in the art and one with general skill in the art would readily recognize that wet etching could be substituted to the dry etching process of Yun et al. and expect successful results.

Finally, even though the prior art does not specifically teach the thickness of the protective layer formed, it would be obvious to one with ordinary skill in the art to arrive at such thickness since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

***Allowable Subject Matter***

5. Claims 8-12, 15-16, 28-32 and 34-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is an examiner's statement of reasons for allowance: the prior art does not teach or suggest using a process such as disclosed by Yun et al. followed by the removal of photoresist through a wet etching process. Also the prior art does not teach or suggest treating the conductive material to form a protective layer using an oxygen plasma, a thermal oxidation, UV radiation or ozone, prior to removing the photoresist.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

Art Unit: 2825

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renzo Rocchegiani whose telephone number is (703) 308-5839. The examiner can normally be reached on Monday through Friday from 8:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached at (703) 308-1323. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

RNR

September 4, 2003

  
CARIDAD E. BRYANT  
PRIMARY EXAMINER